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A NEVADA FAUNA OF PLEISTOCENE TYPE AND ITS PROBABLE ASSOCIATION WITH MAN

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The purpose of this paper is to place on record in a brief and preliminary way the discovery of an interesting series of Pleistocene or early post-Pleistocene mammalian fossils and to give new evidence that man was associated with faunas of this type in North America.

The field observations and the collection here recorded were made by a party personally organized and led by Mr. Fenley Hunter, which worked from December 30, 1932, to February 3, 1933. Mr. Albert C. Silberling accompanied the expedition, and his long field experience was invaluable. The greater part of the material collected was very generously presented by Mr. Hunter to the American Museum of Natural History, where most of it has been prepared by Mr. Albert Thomson and a less amount by Mr. Carl Sorensen and others. The field observations here given are derived from the excellent notes provided by Mr. Hunter and Mr. Silberling, and the field photographs are also by Mr. Hunter. Dr. N. C. Nelson gave valuable advice and opinions concerning the probable association of man. Mr. Edwin Colbert assisted in the study of some of the fossil mammals. The writer assumes responsibility for the statements made, but the discoveries recorded are not his and he gratefully acknowledges the collaboration of all these gentlemen.

LOCALITY AND OCCURRENCE

The area explored is in Clark County, southeastern Nevada, and includes all the exposed strata of Pleistocene (or early post-Pleistocene) age along the main drainage of the Las Vegas Valley, northwest of the town of Las Vegas. The major part of the work was done from two camps, one at Indian Springs and a second, more important from the standpoint of collections made, five miles east of the Tule Springs turn-off from the main highway. The Valley east of Indian Springs is a structural valley between ranges of block-faulted mountains. The mountain bases are covered by fan conglomerates, the older parts of which are probably contemporaneous with the less coarse and more distinctly stratified Pleistocene beds of the middle of the Wash.

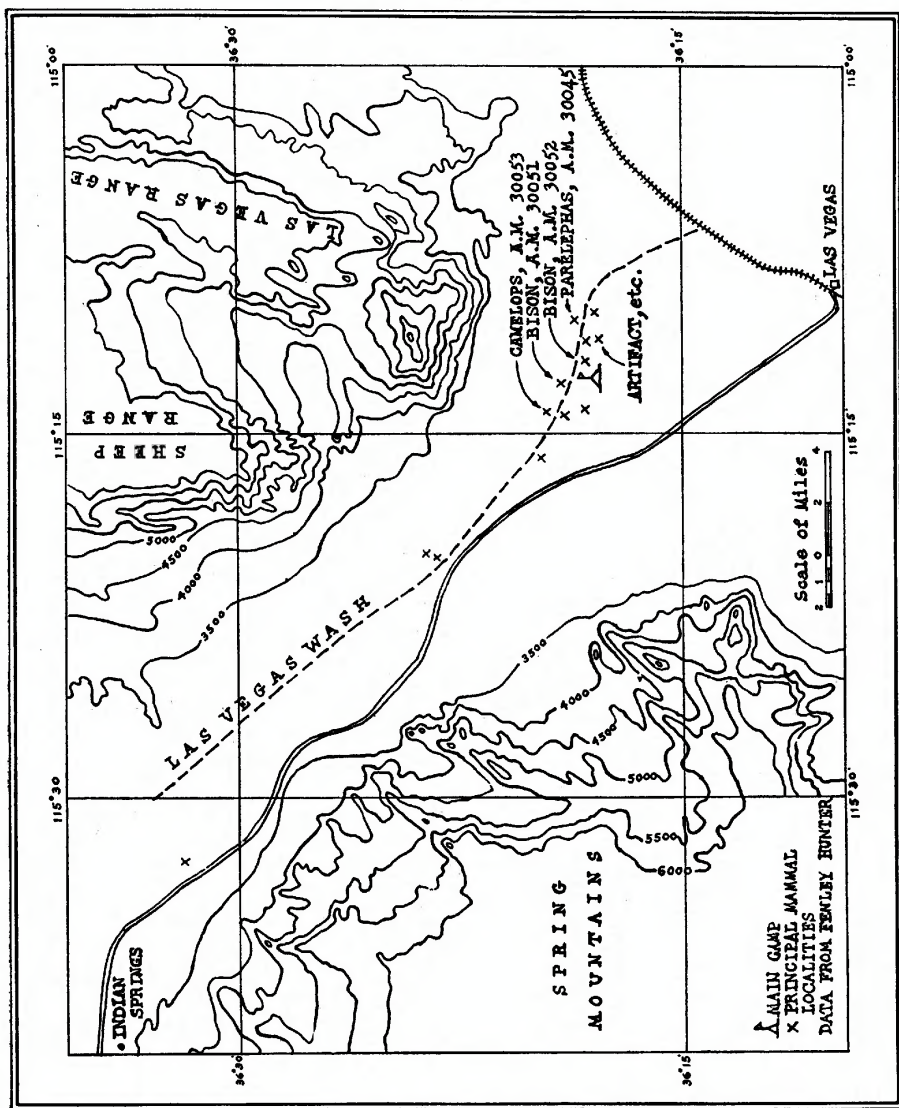


Fig. 1. Sketch map of part of Clark County, Nevada, showing the localities mentioned in the text. (Base from U. S. Geological Survey topographic sheet.)

The oldest part of the exposed series consists of tan-colored clays, into which are incised, or on which are disconformably superimposed, lighter-colored beds which seemed to the field observers to represent stream channel and flood plain deposits. All the identifiable fossils were found in these light-colored strata. Above them is another series of buff sandy clays, in their turn overlain by a series of lighter color. These upper beds yielded no identifiable fossils. In the opinion of Mr. Hunter and Mr. Silberling, the formation suggests aeolian action ex-

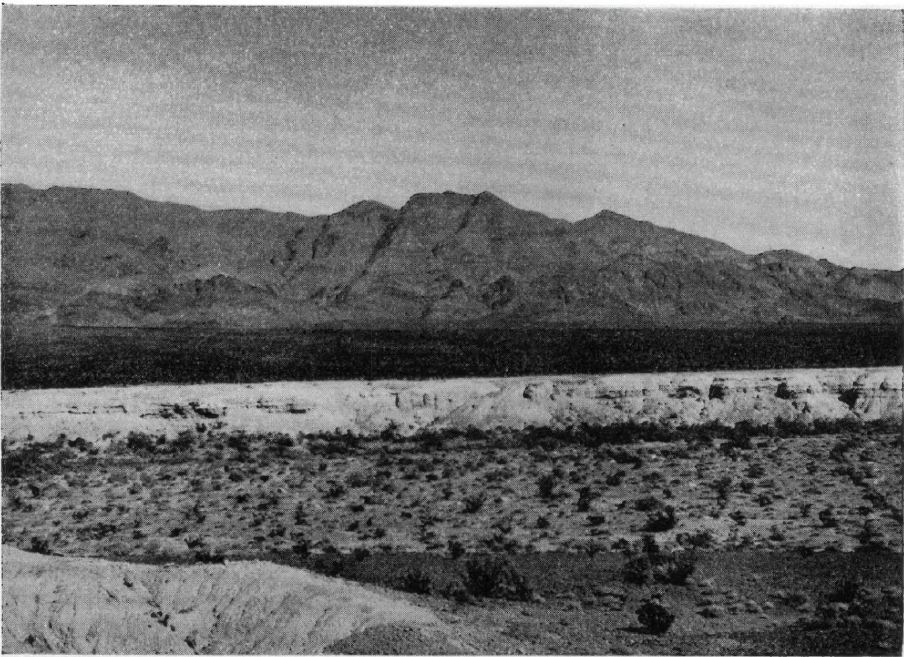


Fig. 2. Looking northeast from near the main camp, with the main wash of the Las Vegas Valley and exposed mammal-bearing Pleistocene beds in the foreground, and the southern end of the Las Vegas Range in the background.

cept for the supposed stream deposits in the lower part of the Pleistocene beds. As subsequently examined in the laboratory, the collection further indicates the presence of a body or bodies of fresh water of some duration. Numerous shells, especially from the artifact locality but said to occur throughout the area in the mammal-bearing beds, clearly are aquatic forms. These have not yet been studied, but they appear to include members or relatives of the genera *Pisidium*, *Planorbis*, *Physa*,

and *Amnicola*. Such a molluscan fauna suggests the shallow freshwater lakes and ponds of the present West, and also the marginal deposits of the Pleistocene lakes of the Great Basin. The mammal beds may represent a period of higher precipitation, followed by a more arid time. In this as in other respects, present data point to the existence in this area of very important evidence, without now permitting its full interpretation.

The series of old sediments has now been extensively eroded, while, as in so many western localities, another more recent and relatively minor shifting of the sedimentary balance is seen in the sand and gravel building up the floor of the Las Vegas Wash, itself incised in the much more extensive deposits of a previous cycle.

There are five major exposures of the old sediments, but only two of these are eroded deeply enough to expose the horizon of identifiable fossils. In the lower levels of the upper beds were found some bone fragments of no value. The mammal-bearing series, proper, appears to be very rich, as shown, for example, by the discovery of mammoth remains at fifty-two different localities. The great majority of the fossils were dissociated, chiefly single and often broken bones and teeth but also rarer jaws and skulls. In only one case, that of a mammoth listed below, were different associated elements of one animal found. Probably most of the remains were transported from the higher areas on each side of the Wash before burial. The skulls found are somewhat crushed and the preservation in general is rather poor. Most of the bones are very light, with loss of organic matter but little or no secondary mineralization.

The short time available, most of which was spent collecting fossil vertebrates, and the unfavorable weather conditions precluded extensive stratigraphic and physiographic study, but indicated its desirability and the probability that it would give clear and very important results. Like the fauna, as suggested below, the physical data now at hand indicate great historical antiquity for the deposit and show it to be either Pleistocene or earliest post-Pleistocene. A more precise statement must follow further work.

MAMMALIAN FAUNA

The identifications here given are preliminary and subject to some possible revision with more extensive collections and more intensive study, but they give an adequate idea of the general nature of the fauna.

Fossils were collected from three general localities:

A. Eight miles east-southeast of Indian Springs, between present highway and old railroad grade:

Odocoileus sp. Foot bones.

B. About four miles south-southeast of Corn Creek Springs:

Lepus sp. Fragmentary limb bones.

Parelephas ?columbi. Molars.

Camelops sp. Isolated bones.

Odocoileus sp. Isolated bones.

C. Within a radius of three miles of the principal camp of the party, which was located about ten miles north-northwest of Las Vegas, about five miles east of the Tule Springs turn-off from the main highway, three hundred yards from the south rim of the Big Wash. This is a rich area where the greater part of the collection was made.

Thomomys ?perpallidus. One specimen, lower teeth from the artifact locality.

Nothotherium sp. A single specimen, an imperfect cranium lacking face or teeth, Amer. Mus. No. 30061. Although apparently somewhat aberrant, this cranial fragment appears to be of this genus and may even be *N. shastense*. Detailed comparison has not yet been possible.

Parelephas columbi. This is far the most abundant animal in the collection. Several isolated teeth and other fragments appear to represent a single species, considered as the Columbian mammoth. A skull, distorted but nearly complete, and the poorly preserved lower jaw and some skeletal elements of the same individual were found, apparently representing a very old female (Amer. Mus. No. 30045). This was the only discovery of associated parts of one individual of any species of mammal.

Equus pacificus. Two large upper molars appear to be of this species and probably some of the larger lower teeth belong to this species also. Horses are not as yet well represented.

Equus spp. A single small tooth from one mile west of camp seems surely to be distinct from *E. pacificus* but cannot be exactly identified. Among the other lower teeth from various localities, there are several, poorly preserved, which seem to represent a horse of intermediate size and may belong to a third species, but do not surely do so.

Camelops hesternus. This species was abundant, a mandible with the complete dentition of both sides being found (Amer. Mus. No. 30053), as well as many isolated teeth and skeletal parts.

Odocoileus sp. Rare remains of a small deer, doubtless of this genus, include the base of a shed antler and some isolated bones, but no teeth.

Bison aff. *occidentalis*. Two nearly complete bison skulls (Amer. Mus. Nos. 30051 and 30052) and several teeth and other fragments are in the collection. This is not *Bison occidentalis*, by current standards of species making, and would have to be placed in a new species. It belongs, however, to the general group of *B. occidentalis*, *crassicornis*, *chaneyi*, *taylori*, *texanus*, and possibly some others, without

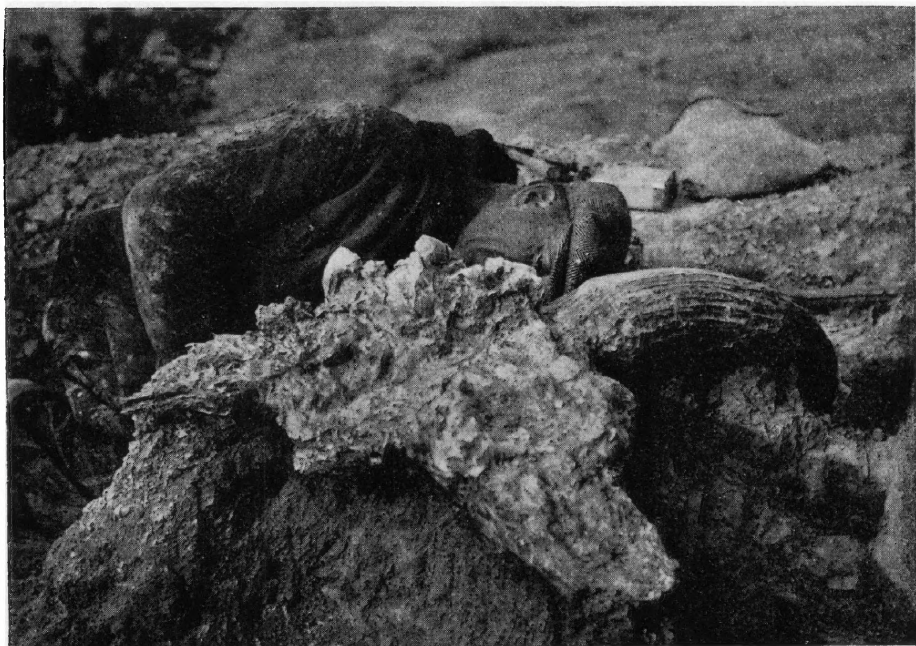


Fig. 3. Bison skull, Amer. Mus. No. 30052, in situ.

resembling any one of these closely enough for specific reference. It differs from typical *occidentalis* chiefly in being more robust, with broader frontals and longer and stouter horn cores. I decline to erect another species in this abused group, without adequate revision, and reserve these specimens for the use of a future reviser.¹

¹The current belief that some fifteen to twenty species of bison, all of which inhabited the United States during the Pleistocene, are now represented in collections, with the implication that the actual number of species may have been twice that or even more, seems to me to border on the absurd. The criteria often employed for defining these supposed species do not seem to have been selected or evaluated on a really sound scientific basis. By these criteria, the present specimens would represent one and perhaps two new species just as distinct as any of those now in the lists, but it seems highly inadvisable to continue the erection of such "species," and the matter is left *sub judice*.

This fauna is obviously of Pleistocene character. Of the forms of mammals so far known, at least 65% are extinct and these all belong to species or genera apparently confined to the Pleistocene. On this basis, and also on the basis of the presence of horses, camels, etc., some students would be inclined to place the fauna in the Early Pleistocene; indeed the correlations devised by the late O. P. Hay would probably place it as very earliest Pleistocene. Yet it seems increasingly doubtful whether these considerations are really valid. The percentage method of correlation has been rather thoroughly discredited, except in a highly modified form not in any event applicable to a fauna, like this, in which very few species are known and these almost exclusively of one faunal element—the large herbivores. As to correlation on differential extinction, as I have elsewhere pointed out,¹ this involves the belief that the exact or approximate time of extinction of a number of common genera is known and the hypothesis that this time was appreciably the same all over the United States, or North America, and at present neither this belief nor this hypothesis seems to be justified. The subject is very complex and confusing, but the whole trend of recent evidence seems to be toward the theory that many of the animals once considered as typical of the older Pleistocene really survived to a relatively recent date, at least in certain areas, some of them perhaps even into the geological epoch Recent.² That so many mammals should have survived the Pleistocene, only to die out toward or slightly after its end, is a very extraordinary thing. Its causal explanation, while not beyond conjecture, remains mysterious, but at present the evidence seems to indicate it as a fact.

PROBABLE ASSOCIATION OF MAN

At a locality one-half mile east of the main camp (the location of which is given above) on the south side of a short coulee 200 yards from the Big Wash, there was found highly suggestive if not absolutely conclusive evidence of the coexistence of man with the fauna listed

¹For instance in: Simpson, G. G. 1929. 'Pleistocene Mammalian fauna of the Seminole Field, Pinellas County, Florida.' *Bull. Amer. Mus. Nat. Hist.*, LVI, pp. 561-599.

²For a vigorous but not entirely accurate protest against this point of view see: Hay, O. P. 1930. 'Remarks on Dr. George G. Simpson's work on the Pleistocene paleontology of Florida.' *Journ. Washington Acad. Sci.*, XX, pp. 331-340.

It is not proposed to answer Doctor Hay's arguments, which he can no longer defend and which are probably accepted by few of his colleagues, beyond reaffirming the essentials of my former views (not particularly original with me) and suggesting as a matter of record that Doctor Hay's expression of my opinions is in some respects not what I had myself tried to say. It may also be noted that, due to a long absence from this country, I did not see a copy of Doctor Hay's attack until after the close of his distinguished and eminently useful career, and that the following article, although it appears by coincidence to have answered some of his arguments, was written before his paper appeared and published before the latter was seen: Simpson, G. G. 1931. 'Origin of mammalian faunas as illustrated by that of Florida,' *Amer. Nat.*, LXXV, pp. 258-276.

above. There was here a very local stratum in which isolated teeth and bone fragments were particularly abundant. In quarrying for these, a flake of obsidian was found. This was in undisturbed matrix at a depth of four feet six inches and well in from the eroded bank. The actual discovery was made by Albert C. Silberling who has had much experience in collecting fossils, especially in the Fort Union, and well appreciates the importance of distinguishing contemporaneous and redeposited material. He asserts that the obsidian flake was originally deposited in the ancient stratum as found, and Mr. Hunter, who was



Fig. 4. The "artifact locality." The artifact was derived from the deeper part of the cut in which the men are working. The pick held by the man to the left points to the exact site of the artifact.

also present, is strongly of the same opinion. The obsidian was left in undisturbed matrix, with only one side exposed, and was brought to the Museum in a bandaged block. There it was removed and cleaned by me in the presence of Dr. N. C. Nelson, Mr. Hunter, and Mr. Junius Bird. A small piece, an angle broken off the main flake, was found in the matrix about 3 mm. from the flake. Doctor Nelson states that the obsidian flake is not an implement, that is, had not been fashioned to a

definite and completed form for use, but that it is with high probability an artifact, that is, owes its present form to some activity of man. As shown in the figure, one side has been irregularly flaked, while the other shows a definite bulb of percussion and a single fracture surface. A small piece of bone, indeterminate but fossilized to the same degree and in the same way as others unquestionably belonging to extinct species in this formation, adhered to the lower side of the artifact.

The probability that this obsidian flake had been transported by man is greatly increased by the fact that no other obsidian in any form was observed in the formation or anywhere in the surrounding region. The evidence is further substantiated in an important way by the presence of charcoal. This was scattered in small amounts

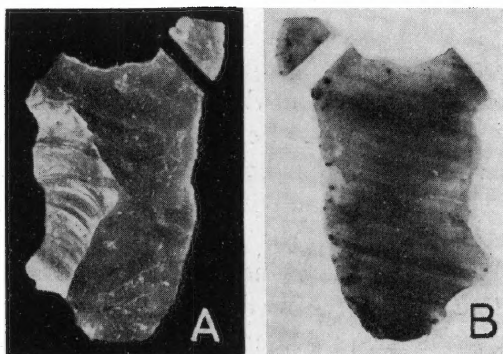


Fig. 5. Supposed artifact. A, Irregularly chipped side (photographed in reflected light). B, Side with single fracture surface (photographed in transmitted light). Natural size.

through the bone pocket but the greater part of it was concentrated in three small, well defined areas, in one of which the obsidian occurred. These strongly suggest campfire sites, although without large stones or other suggestion of a definitely constructed cooking place. The stratum with the teeth, bones, obsidian, and charcoal lay above an eroded surface in the tan-colored lower beds, and was evidently at or very near the same level as the majority of the fossil mammals found in the formation in this area. With one exception (at the same level and a short distance away from the major occurrence), no charcoal was otherwise found in the region investigated, from Las Vegas to Indian Springs.

The mammalian remains in immediate association with the obsidian and charcoal belonged to the following forms, so far as identified:

Thomomys ?perpallidus. Lower teeth of one individual.

Equus pacificus. Two upper and probably some lower teeth.

Equus sp. Several lower teeth probably of a smaller species.

Also an astragalus of undetermined affinities.

Camelops hesternus. Numerous teeth, a fragmentary jaw and a phalanx.

Odocoileus sp. Isolated foot bones.

Bison sp. Teeth and a fragmentary jaw. Apparently an extinct form, and probably the same as the two skulls listed above, one of which was found in the same small coulee and at the same level.

Some of the large bone fragments apparently represent mammoth, and in any event the occurrence of the latter in the same beds and up to fifteen feet higher stratigraphically in the same area indicates its contemporaneity. The majority of the camel teeth are of immature or even juvenile individuals, although the fragmentary jaw is of a very old individual. Several of the horse teeth are also of young individuals. The broken bone fragments so numerous in this pocket may represent human activity, although no distinct tool marks are visible on them.

In itself, this occurrence is not absolutely conclusive, but it is strongly suggestive and is recorded as a datum of some importance in the rapidly accumulating evidence of the association of man with faunas of this type in North America, and as an indication of an important field for further investigation.